

# LIBERTY LAKE SEWER AND WATER DISTRICT

## TOXICS MANAGEMENT PLAN UPDATE



Prepared by:



11707 E Montgomery Drive  
Spokane Valley, Washington 99206  
(509) 838-3810

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**LIBERTY LAKE SEWER & WATER DISTRICT**  
**TOXICS MANAGEMENT PLAN**  
**2017 Update**

This letter updates the previous Liberty Lake Sewer and Water District's (LLSWD) 2016 Toxics Management Plan.

**INTRODUCTION**

The objective of this update is to generate a baseline for Polychlorinated Biphenyl (PCB) removal rates that are achieved in the existing wastewater treatment plant. This baseline will be used to determine measurable progress resulting from upgrades to the treatment process that is now being constructed, other activities in the collection system, and public education. As noted in the 2016 update testing for PCBs in the collection system has failed to identify controllable sources and further testing for PCB sources within the collection system would provide inconclusive results. A focus on the performance of the treatment process to remove individual PCB congeners will provide valuable information to show the District's measurable progress as required by the NPDES permit.

**SAMPLE LOCATIONS**

Treatment plant influent and effluent samples were taken at the headworks and at end of pipe of the treatment plant at the same location as previous samples.

**SAMPLE DATES**

- April 16, 2012
- October 8, 2012
- April 15, 2013
- April 23, 2016
- July 2, 2016
- October 21, 2016
- December 22, 2016
- February 3, 2017

**DATA**

Except for a single October 2016 data point and the influent concentrations in December of 2016, the overall influent PCB concentrations have remained relatively consistent over the past six years. We will continue to monitor influent total PCB concentrations as well as Homolog and Congener concentrations and note any discernable increases or decreases.

The following is a general analysis of the observed PCB removal rates for individual congeners, homologs, and total PCBs resulting from the treatment process. Overall removal rates were very high with variations likely due to mixing and residence time within the plant as well as the low detection limits.

As with previous analyses a correction for blank sample results was used. Any total concentration less than ten (10) times the blank concentration was discarded (counted as zero).

**CONGENERS**

Individual congeners entering and leaving the system are, in general, very low in concentration making tracking of their removal difficult. Results are somewhat inconclusive and show negative removal for some of the congeners. This is likely due to one of two issues:

- Concentrations are at, below, or near detection limits
- A residence time of 1-3 days and the mixing of influent with residual treated sewerage leading to sampling effluent a day or more older than the influent sample

Individual congener removal rates and data are included in the appendices.

**HOMOLOGS**

In general influent and effluent test results indicate homolog removal on average 94% for total PCBs. Mono homolog PCBs showed lower removal rates and in some instances, negative removals. It should be noted that Mono PCBs are represented in very low

concentrations and, as noted above, there are likely variations in the sample concentrations due to mixing and residence time within the plant.

Homolog concentrations and removals can be found in the table at the end of this update as well as in the attached lab results.

#### **TOTAL PCBs.**

Overall, the plants' efficiency appears very high (94% on average) and has performed consistently at this level since influent/effluent testing began in 2012. The following table includes removal rates for all homologs and total PCBs for three sample sets from 2016, one 2013 set, and two dates in 2012.

As with homologs, influent/effluent concentrations and removals can be found in the table at the end of this report.

#### **CONCLUSIONS**

The current treatment process at the District's plant has consistently removed total PCBs at rates between 92% and 98%. The toxic substances control act (TSCA) does not regulate products that contain PCBs below concentrations of 50 ppm. This makes source control more difficult. Currently, removal of PCBs through the wastewater treatment process appears to be the most effective method of reducing PCB discharges to the Spokane River from the District's wastewater. LLSWD is currently undergoing extensive plant upgrades, including the addition of micro filtration to the treatment process, which should further increase removal efficiency and consistency. The data from 2012 to present, included in the table on the following page and in the attachments, should provide a good baseline for congener, homolog, and total PCB removal going forward.

Until sources of PCBs in consumer products is aligned with PCB levels required in discharge limits we recommend continuing with sampling of influent and effluent and avoiding costly unproductive testing within the collection system. By monitoring individual congener and overall PCB influent and effluent concentrations LLSWD will be able to track influent constituents, treatment plant removal rates, and measurable progress.

LIBERY LAKE SEWER & WATER DISTRICT  
Water Reclamation Plant - PCB Removal Rates

Sample Date	MonoPCB			DiPCB			TriPCB			TetraPCB			PentaPCB			HexaPCB			HeptaPCB			OctaPCB			NonaPCB			DecaPCB			Total PCB		
	Infl. Conc.	Eff. Conc.	Rem. %	Infl. Conc.	Eff. Conc.	Rem. %	Infl. Conc.	Eff. Conc.	Rem. %	Infl. Conc.	Eff. Conc.	Rem. %	Infl. Conc.	Eff. Conc.	Rem. %	Infl. Conc.	Eff. Conc.	Rem. %	Infl. Conc.	Eff. Conc.	Rem. %	Infl. Conc.	Eff. Conc.	Rem. %	Infl. Conc.	Eff. Conc.	Rem. %	Infl. Conc.	Eff. Conc.	Rem. %	Infl. Conc.	Eff. Conc.	Rem. %
April 16, 2012	21.4	-	100%	262	-	100%	389	45.1	88%	610	11	98%	857	-	100%	423	-	100%	201	-	100%	34.3	-	100%	-	-	-	-	-	-	2800	56.1	98%
October 8, 2012	61.8	28.5	54%	435	91.3	79%	390	15.4	96%	454	181	60%	1540	-	100%	849	14.2	98%	251	-	100%	44	-	100%	25	-	100%	-	-	-	4050	330	92%
April 15, 2013	55	80.6	-47%	612	65.2	89%	612	70	89%	1140	25.9	98%	1500	34.60	98%	771	27	96%	450	7.60	98%	129	3.50	97%	36.8	-	100%	25.20	8.60	66%	5340	323	94%
April 23, 2016	33.9	171	-404%	323	37.2	88%	367	5.71	98%	996	8.9	99%	774	2.70	100%	691	1.4	100%	282	0.60	100%	94.3	1.46	98%	5	3.30	34%	0.90	0.80	11%	3560	226	94%
July 2, 2016	38.4	166	-332%	408	55.9	86%	468	32.2	93%	509	21.8	96%	1250	32.80	97%	704	9.45	99%	427	0.20	100%	50.2	1.59	97%	1.9	0.40	79%	3.00	0.60	80%	3860	319	92%
Oct 21, 2016	21.5	13.9	35%	614	64	90%	701	56.2	92%	1810	30.2	98%	3710	42.20	99%	1130	28.8	97%	615	0.20	100%	412	0.10	100%	99.9	0.40	100%	15.10	0.10	99%	9130	235	97%
Dec 22, 2016	-	-	-	-	-	-	57.6	-	-	28.1	-	-	488	-	-	-	-	-	137	-	-	21.4	-	-	-	-	-	-	-	778	-	-	
Average	38.7	76.7	-99%	442.3	52.3	89%	487.8	37.4	93%	919.8	46.5	92%	1605.2	18.7	99%	761.3	13.5	98%	371	1.4	100%	127.3	1.1	99%	28.1	0.7	69%	7.37	1.68	43%	4790	248.183 3	94%